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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/081,668 | 02/20/2002 | Hee Wong | P05133 | 2093 |

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| EXAMINER | |
|---|---|
| WARE, CICELY Q | |
| **ART UNIT** | **PAPER NUMBER** |
| 2611 | |

DATE MAILED: 06/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/081,668 | WONG ET AL. | |
| | Examiner | Art Unit | |
| | Cicely Ware | 2611 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. Applicant's arguments, see **REMARKS**, filed 4/24/2006, with respect to claims 1 11, 21 have been fully considered and are persuasive. The final rejection filed on 2/22/2006 has been withdrawn.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 11-16, 21, 22 under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Ad (Fig. 1) in view of Newell et al. (US Patent 5,150,121) in further view of Davis (US Patent 5,377,225).

(1) With regard to claim 1, Applicant's Admitted Prior Ad discloses in (Fig. 1) a receive path circuit in a radio frequency (RF) receiver (100) comprising: a first radio frequency mixer (120A) having a first input port capable of receiving said in-phase product signal from said LO circuit (1 10) and a second input port capable of receiving a modulated radio frequency signal (105), wherein said first RF mixer generates a first downconverted output signal (Pg. 3, lines 1-2, 15-24).

However Applicant's Admitted Prior Art does not disclose a local oscillator circuit capable of receiving a local oscillator reference signal having frequency and a double

sideband clock signal having a frequency, and generating therefrom an in-phase product signal of said reference signal and said DSB clock signal in which a polarity of said LO reference signal is reversed at said DSB frequency of said DSB clock signal.

However Newell et al. discloses in (Fig. 2) a local oscillator circuit capable of receiving a local oscillator reference signal (38) having frequency and a double sideband clock signal (34) having a frequency (col. 3, Lines 4-12, col. 5, Lines 25-68-col. 6, liens 1-29, col. 7, lines 1-22).

Therefore it would have been obvious to one of ordinary skill in the art to modify Applicant's Admitted Prior Art in view of Newell et al. to incorporate a local oscillator circuit capable of receiving a local oscillator reference signal having frequency and a double sideband clock signal having a frequency, and generating therefrom an in-phase product signal of said reference signal and said DSB clock signal in which a polarity of said LO reference signal is reversed at said DSB frequency of said DSB clock signal in order to synchronously demodulate the DSB-SC signal to produce the originally encoded baseband signal (col. 5, Lines 45-47).

However Applicant's Admitted Prior Art in combination with Newell et al. do not disclose generating an in-phase product signal of said LO reference signal and said DSB clock signal in which a polarity of said LO reference signal is reversed at said DSB frequency of said DSB clock signal.

However Davis discloses generating an in-phase product signal of said LO reference signal and said DSB clock signal in which a polarity of said LO reference signal is reversed at said DSB frequency of said DSB clock signal (col. 1, lines 44-49,

col. 7, lines 7-46, col. 9, lines 6-63, col. 14, lines 8-34, col. 19, lines 60-68 – col. 20, lines 1-6, col. 22, lines 24-39).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Applicant's Admitted Prior Art in combination with Newell et al. in view of Davis to incorporate generating an in-phase product signal of said LO reference signal and said DSB clock signal in which a polarity of said LO reference signal is reversed at said DSB frequency of said DSB clock signal in order to synchronously demodulate the DSB-SC signal to produce the originally encoded baseband signal.

(2) With regard to claim 2, claim 2 inherits all the Limitations of claim 1. Newell et al. further discloses in (Fig. 4) wherein said LO circuit is further capable of generating a quadrature phase product signal from said LO reference signal and said DSB clock signal, wherein said quadrature phase signal is shifted approximately 90 degrees with respect to said in-phase product signal and wherein a polarity of said LO reference signal is reversed at said DSB frequency of said DSB clock signal (col. 3, Lines 17-23, col. 5, Lines 32-47, 01. 6, lines 30-64).

(3) With regard to claim 3, claim 3 inherits all the limitations of claim 2. Applicant's Admitted Prior Art discloses in (Fig. 1) a second radio frequency mixer (102B) having a first input port capable of receiving said quadrature phase product signal from said LO circuit (110) and a second input port capable of receiving said modulated radio frequency signal, wherein said second RF mixer generates a second downconverted output signal (Pg. 3, Lines 1-2, 15-24).

(4) With regard to claim 4, claim 4 inherits all the limitations of claim 3. Newell et

al. further discloses in (Fig. 2) wherein said LO circuit comprises a multiplier (34) that receives an in-phase LO reference signal (36) and said DSB clock signal (34) and generates therefrom said in-phase product signal (40) (col. 3, lines 7-12).

(5) With regard to claim 5, claim 5 inherits all the Limitations of claim 4. Newell et al. further discloses wherein said multiplier is an analog multiplier (col. 4, Lines 42-56).

(6) With regard to claim 6, claim 6 inherits all the limitations of claim 4. Newell et al. further discloses in (Fig. 5) wherein said multiplier is an exclusive-OR gate (78, 82).

(7) With regard to claim 11, see rejection of claim 1. Applicant's Admitted Prior Art further discloses in (Fig. 1) a receiver front-end circuit (100) capable of receiving an incoming RF signal from an antenna (105) and filtering (130A, 13OB) and amplifying (105) said incoming RF signal.

(8) With regard to claim 12, claim 12 inherits all the Limitations of claim 11. See rejection of claim 2.

(9) With regard to claim 13, claim 13 inherits all the limitations of claim 12. See rejection of claim 3.

(10) With regard to claim 14, claim 14 inherits all the limitations of claim 13. See rejection of claim 4.

(11) With regard to claim 15, claim 15 inherits all the Limitations of claim 14. See rejection of claim 5.

(12) With regard to claim 16, claim 16 inherits all the Limitations of claim 14. See rejection of claim 6.

(13) With regard to claim 21, see rejection of claim 1.

(14) With regard to claim 22, claim 22 inherits all the limitations of claim 21. See rejection of claim 3.

4. Claims 7, 8, 17, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (Fig. 1) in view of Newell et al. (US Patent 5,150,121) in view of Davis (US Patent 5,377,225), as applied to claims 3 and 13, in further view of Mohindra (US Patent Application 2003/0031273).

(1) With regard to claim 7, claim 7 inherits all the limitations of claim 3. Applicant's Admitted Prior Art in combination with Newell et al. in combination with Davis disclose all the limitations of claim 3. However Applicant's Admitted Prior Art in combination with Newell et al. do not disclose wherein said first downconverted output signal of said first RF mixer is a double-sideband suppressed carrier signal.

However Mohindra discloses in (Fig. 2) wherein said first downconverted output signal (LNA, L1, M1) of said first RF mixer (M1) is a double-sideband suppressed carrier signal (Pg. 1, c01. 1, lines 45-56, Pg. 2, col. 1 , Lines 3-13, 37-40).

Therefore it would have been obvious to one of ordinary skill in the art to modify Applicant's Admitted Prior Art in combination with Newell et al. in combination with Davis to incorporate wherein said first downconverted output signal of said first RF mixer is a double-sideband suppressed carrier signal in order for the modulator to work with sufficiently low signal levels wherein fifth and higher order distortion can be ignored.

(2) With regard to claim 8, claim 8 inherits all the limitations of claim 7. Mohindra further discloses in (Fig. 2) wherein said second downconverted output signal (LNA, L1, M2) of said second RF mixer (M2) is a double-sideband suppressed carrier signal (Pg. 1, col. 1, lines 45-56, Pg. 2, col. 1, lines 3-1 3, 37-40).

(3) With regard to claim 17, claim 17 inherits all the limitations of claim 13. See rejection of claim 7.

(4) With regard to claim 18, claim 18 inherits all the Limitations of claim 17. See rejection of claim 8.

***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

*Cicely Ware*

cqw
June 13, 2006

KHAI TRAN
PRIMARY EXAMINER